UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,601	12/10/2001	Jiebo Luo	83492THC	5347

7590 10/21/2004

Thomas H. Close
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER	
ROSARIO-VASQUEZ, DENNIS	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/016,601	LUO ET AL.	
	Examiner	Art Unit	
	Dennis Rosario-Vasquez	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/10/2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/10/2001
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The IDS filed on 12/10/01 has reference titled "Fundamentals of Digital Image Processing". However, the reference was not found using IFW.

Drawings

2. The informal drawings of figs. 1 and 8 are not of sufficient quality to permit examination. Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to this Office action. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

Applicant is given a TWO MONTH time period to submit new drawings in compliance with 37 CFR 1.81. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a). Failure to timely submit replacement drawing sheets will result in ABANDONMENT of the application.

Figures 1 and 8 are difficult to read.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-13,15,17,19-21 and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Savakis et al. (US Patent 6,738,494 B1).

Regarding claim 1, Savakis et al. discloses a method for processing a digital color image, comprising the steps of:

a) providing a subject matter detector (Fig. 12, num. 10: IMAGE ASSESSMENT NETWORK) for distinguishing between target (people) and background subject matters (Fig. 2 is a detailed view of fig. 12, num. 10 where numeral 34 determines background from foreground or people in col. 17, lines 28-30.);

b) applying the subject matter detector (Fig. 12, num. 10: IMAGE ASSESSMENT NETWORK) to the image (An image from the IMAGE CAPTURE DEVICE of fig. 12) to produce a belief map (The output of fig. 12, num. 10 is a belief map.) indicating the degree of belief that pixels in the image belong to target subject matter;

c) providing an image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) that is responsive to a control signal (Output of fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER outputs a selection signal for activating the enhancement modules.) for controlling the degree of image enhancement; and

d) applying image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) to the digital image (An image from the IMAGE CAPTURE DEVICE of fig. 12) by varying the control signal (Output of fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER outputs a selection signal for activating the enhancement modules.) according to the belief map (The output of fig. 12, num. 10 is a belief map.) to produce an enhanced image (Fig. 12, label "PROCESSED DIGITAL IMAGES" are enhanced images.).

Regarding claim 2, Savakis et al. discloses the method claimed in claim 1, wherein a plurality of subject matter detectors (Fig. 2, num. 26: SKIN DETECTOR and num. 34:MAIN SUBJECT DETECTOR) are provided, and further comprising the step of selecting one or more of the provided subject matter detectors (Fig. 2, num. 14 is a classifier that selects features from both detectors.).

Claim 3 was addressed in claim 1.

Regarding claim 4, Savakis et al. discloses the method claimed in claim 1, wherein the target subject matter (people) is human flesh (Fig. 2,numerals 26 and 24 detect skin and people, respectively.).

Regarding claim 5-8 a target subject matter is a "natural scene" in col. 17, lines 12,13.

Regarding claim 9, Savakis et al. discloses the method claimed in claim 1, wherein the image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) is sharpening (The modules perform a sharpening operation in col. 6, lines 8-12).

Regarding claim 10, Savakis et al. discloses the method claimed in claim 1, wherein the image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) is noise reduction (Fig. 12, num. 122 is a noise reduction operation in col. 9, lines 7-9.).

Regarding claim 11, Savakis et al. discloses the method claimed in claim 1, wherein the image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) is tone scale adjustment (The modules perform a tone scale operation in col. 6, lines 8-12.).

Regarding claim 12, Savakis et al. discloses the method claimed in claim 1, wherein the image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) is scene balance adjustment (The input images are color balanced for predominant global effects in col. 15, lines 34,35.).

Regarding claim 13, Savakis et al. discloses the method claimed in claim 1, wherein the image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) is color re-mapping (The modules 122 of fig. 12 "enhance color" in col. 6, lines 8-11.).

Regarding claim 15, Savakis et al. discloses the method claimed in claim 1, wherein the image enhancement operation (Fig. 12, num. 122b and 122c are enhancement transform modules.) is image magnification (Fig. 2, num. 22:"CLOSE UP ?" generates a magnification value that is outputted to the enhancement modules 122 via num.180.) employing interpolation (Fig. 12, num. 122b and 122c are enhancement transform modules that perform interpolation in col. 10, lines 8-10.).

Claim 17 has been addressed in claims 4-8.

Regarding claim 19, Savakis et al. discloses the method claimed in claim 1, wherein the control signal (Output of fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER outputs a selection signal for activating the enhancement modules.) is varied (The output of fig. 12, num. 180 varies from a value of 1 to 3 in col. 9, lines 41-60 .) in accordance to the belief map (The output of fig. 12, num. 10 is a belief map.) and to a signal (Fig. 2, num. 32:SUBJECT SIZE outputs a signal to create the belief map or APPEAL BELIEF of fig. 2.) related to the sizes of regions (Savakis states," The size of the main subject is determined...in the...main subject belief map (c:18,l.66 to c:19,l.2).") within the belief map (The output of fig. 12, num. 10 is a belief map.).

Regarding claim 20, Savakis et al. discloses the method claimed in claim 1, wherein the control signal (Output of fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER outputs a selection signal for activating the enhancement modules.) is varied (The output of fig. 12, num. 180 varies from a value of 1 to 3.) in accordance to the belief map (The output of fig. 12, num. 10 is a belief map.) and a signal (Output of fig. 30:COMPOSITION outputs a MAIN SUBJECT CENTRALITY signal shown in fig. 3,num. 30.2) related to the locations (centrality) of regions (main subject) within the belief map (The output of fig. 12, num. 10 or fig. 2, num. 10 is a belief map.).

Regarding claim 21,Savakis et al. discloses the method claimed in claim 1, wherein the control signal (Output of fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER outputs a selection signal for activating the enhancement modules.) is varied (The output of fig. 12, num. 180 varies from a value of 1 to 3.) in accordance to the belief map (The output of fig. 12, num. 10 is a belief map.) and a scalar (A ranked set of appeal values on a scale that measures a rank of importance for each number in the set. Note that the appeal values are numbers or scalar numbers as shown in column 8, fourth equation down shows a ranked set of numbers, R={5,2,...,3}.) derived from an analysis (Fig. 12, num. 180 ranks a set of appeal values or "assessment values" in col. 8, lines 37-40 which are used to create the control signal or "attribute values" outputted from fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER in col. 8, lines 55-57.) of the belief map (The output of fig. 12, num. 10 is a belief map.).

Claim 23 was addressed in claim 21.

Regarding claim 24, Savakis et al. discloses the method claimed in claim 23, wherein the analysis (Fig. 12, num. 180 ranks a set of appeal values or "assessment values" in col. 8, lines 37-40 which are used to create the control signal or "attribute values" outputted from fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER in col. 8, lines 55-57.) includes determining the size (fig. 2, num. 32:SUBJECT SIZE) of each belief region (Fig. 2, num. 34:MAIN SUBJECT DETECTOR detects a main subject region to be outputted with the belief map or APPEAL BELIEF of fig. 2.) and enhancing the control signal (Output of fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER outputs a selection signal for activating the enhancement modules

using data generated in fig. 2, num. 32:SUBJECT SIZE.) based on the size (Fig. 2,num. 32:SUBJECT SIZE).

Regarding claim 25, Savakis et al. discloses a computer program product("software program" in col. 4, lines 34,35) for performing the method of claim 1.

Claim 26 was addressed in claim 1.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savakis et al. (US Patent 6,738,494 B1) in view of Yu et al. (6,636,645 B1).

Regarding claim 14, Savakis et al. does not disclose the limitation of claim 14, but does suggest detecting a format of an image in col. 14, lines 21-40 and fig. 1, num. 40:UNIQUE FORMAT and filtering noise that corresponds to edges in col. 14, lines 4-6 and processed in fig. 1, num. 36:SHARPNESS.

However, Yu et al. teaches a method of using a JPEG format in col. 1, lines 17,18 and noise that corresponds to edges in col. 1, lines 16,17 as suggested by Savakis.

Regarding, claim 14, Yu et al. teaches the method claimed in claim 1, wherein an image enhancement operation (Fig. 3, num. 42 "alleviates coding artifacts" in col. 5, lines 45-48.) is JPEG de-blocking (JPEG blocking is a coding artifact in col. 5, lines 59-61).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Savakis et al.'s teaching of detecting a format (fig. 1, num. 40:UNIQUE FORMAT) of an image with filtering noise (fig. 1, num. 36:SHARPNESS) with Yu et al's teaching of an image enhancement operation (Fig. 3, num. 42 "alleviates coding artifacts" in col. 5, lines 45-48.), because Yu et al's teaching enhances images in col. 5, lines 62,63.

Claim 18 was addressed in claims 9-14.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savakis et al. (US Patent 6,738,494 B1) in view of Malah (US Pub. No.: US 2003/0093279 A1).

Regarding claim 16, Savakis et al. does not disclose the limitation of claim 16, but does suggest selecting multiple interpolation types for an image in col. 10, lines 8-10.

Malah et al. teaches the limitation of claim 16 of a method, wherein an interpolation ("shift interpolation" in paragraph number [0118]) is selectable between bilinear-interpolation ("linear" in paragraph number [0118]) and fractal ("fractal" in paragraph number [0118]) based interpolation.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Savakis et al.'s teaching of selecting multiple interpolation types

with Malah et al's interpolation types, because Malah's interpolation types offers "meaningful bandwidth extensions" in paragraph number [0084].

8. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savakis et al. (US Patent 6,738,494 B1) in view of Kato (US Patent 6,665,446 B1).

Regarding claim 22, Savakis et al. does not disclose the limitation of claim 22, but does suggest changing the number of pixels of an image using sampling (Fig. 12, num. 122b and 122c) in col. 10, lines 12-18. Note that changing the number of pixels suggests a resolution change between an image and an output device as mentioned in col. 10, lines 13-17.

However, Kato teaches sampling (Fig. 1, num. 114a and 114b: SUB-SAMPLING PROCESSOR) between an input image (Fig. 1, num. 111:INPUT IMAGE) and an output image (Fig. 1, Output of fig.1, num. 114a is labeled "U'".) as suggested by Savakis et al.

Regarding claim 22, Kata teaches claim 22 of a method comprising the step of reducing the resolution (fig. 1, num. 114a:SUB-SAMPLING PROCESSOR) of a digital color image (Fig. 1, num. 111:IMAGE INPUT UNIT) prior (Subsampling occurs first in fig. 1, num. 114a then a face recognition in fig. 1, num.116:FACE-AREA RECOGNITION PROCESSOR.) to applying a subject matter detector (Fig. 1, num. 116:FACE-AREA RECOGNITION PROCESSOR).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Savakis et al.'s teaching of sampling (Fig. 12, num. 122) with Kato's teaching of sampling, because the Kato reference teaches "the amount of search processing necessary for recognition can be greatly reduced by utilizing the wavelet

conversion coefficients of a lowest frequency component regarding subsampled UV components. Further, additional preprocessing such as noise removal is unnecessary by utilizing the low-frequency component data (col. 5, line 65 to col. 6, line 4)."

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Luo et al. (US Patent 6,504,951 B1) is pertinent as teaching a method of detecting sky color (Fig. 2,num. 201) using a threshold (fig. 2,num. 209).

Luo (Pub. No.: US 2002/0076100 A1) is pertinent as teaching a method of detecting features of people shown in figure 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRV
Dennis Rosario-Vasquez
Unit 2621

LEO BOUDREAU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600